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Letter dated 24 February 2017 from the Permanent Representatives of France, the United Kingdom of Great Britain and Northern Ireland and the United States of America to the United Nations addressed to the President of the Security Council

Please find attached a list of items, materials, equipment, goods and technology related to chemical weapons programmes (see annex). We should be grateful if you would make the necessary arrangements for the present letter and its annex to be issued as a document of the Security Council and circulated to all members of the Council.

(*Signed*) Matthew **Rycroft** (*Signed*) François **Delattre** (*Signed*) Nikki **Haley**

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Annex to the letter dated 24 February 2017 from the Permanent Representatives of France, the United Kingdom of Great Britain and Northern Ireland and the United States of America to the United Nations addressed to the President of the Security Council

EXPORT CONTROL LIST: CHEMICAL WEAPONS AND PRECURSORS

Precursor Chemical	CAS No.	CWC-Schedule
Thiodiglycol	(111-48-8)	2B
Phosphorus oxychloride	(10025-87-3)	3B
Dimethyl methylphosphonate	(756-79-6)	2B
Methylphosphonyl difluoride (DF)	(676-99-3)	1B
Methylphosphonyl dichloride (DC)	(676-97-1)	2B
Dimethyl phosphite (DMP)	(868-85-9)	3B
Phosphorus trichloride	(7719-12-2)	3B
Trimethyl phosphite (TMP)	(121-45-9)	3B
Thionyl chloride	(7719-09-7)	3B
3-Hydroxy-1-methylpiperidine	(3554-74-3)	Not Listed
N,N-Diisopropyl-(beta)-aminoethyl chloride	(96-79-7)	2B
N,N-Diisopropyl-(beta)-aminoethane thiol	(5842-07-9)	2B
3-Quinuclidinol	(1619-34-7)	2B
Potassium fluoride	(7789-23-3)	Not Listed
2-Chloroethanol	(107-07-3)	Not Listed
Dimethylamine	(124-40-3)	Not Listed
Diethyl ethylphosphonate	(78-38-6)	2B
Diethyl N,N-dimethylphosphoramidate	(2404-03-7)	2B
Diethyl phosphite	(762-04-9)	3B
Dimethylamine hydrochloride	(506-59-2)	Not Listed
Ethylphosphinyl dichloride	(1498-40-4)	2B
Ethylphosphonyl dichloride	(1066-50-8)	2B
Ethylphosphonyl difluoride	(753-98-0)	1B
Hydrogen fluoride	(7664-39-3)	Not Listed
Methyl benzilate	(76-89-1)	Not Listed
Methylphosphinyl dichloride	(676-83-5)	2B
N,N-Diisopropyl-(beta)-amino-ethanol	(96-80-0)	2B
Pinacolyl alcohol	(464-07-3)	2B
O-Ethyl O-2-diisopropylaminoethyl methylphosphonite (QL)	(57856-11-8)	1B
Triethyl phosphite	(122-52-1)	3B
Arsenic trichloride	(7784-34-1)	2B
Benzilic acid	(76-93-7)	2B
Diethyl methylphosphonite	(15715-41-0)	2B
Dimethyl ethylphosphonate	(6163-75-3)	2B
Ethylphosphinyl difluoride	(430-78-4)	2B
Methylphosphinyl difluoride	(753-59-3)	2B
3-Quinuclidone	(3731-38-2)	Not Listed
Phosphorus pentachloride	(10026-13-8)	3B
Pinacolone	(75-97-8)	Not Listed
Potassium cyanide	(151-50-8)	Not Listed
Potassium bifluoride	(7789-29-9)	Not Listed
Ammonium bifluoride	(1341-49-7)	Not Listed
Sodium bifluoride	(1333-83-1)	Not Listed
Sodium fluoride	(7681-49-4)	Not Listed
Sodium cyanide	(143-33-9)	Not Listed
Triethanolamine	(102-71-6)	3B

Phosphorus pentasulphide	(1314-80-3)	Not Listed
Diisopropylamine	(108-18-9)	Not Listed
Diethylaminoethanol	(100-37-8)	Not Listed
Sodium sulphide	(1313-82-2)	Not Listed
Sulphur monochloride	(10025-67-9)	3B
Sulphur dichloride	(10545-99-0)	3B
Triethanolamine hydrochloride	(637-39-8)	Not Listed
N,N-Diisopropyl-2-aminoethyl chloride hydrochloride	(4261-68-1)	2B
Methylphosphonic acid	(993-13-5)	2B
Diethyl methylphosphonate	(683-08-9)	2B
N,N-Dimethylaminophosphoryl dichloride	(677-43-0)	2B
Triisopropyl phosphite	(116-17-6)	Not Listed
Ethyldiethanolamine	(139-87-7)	3B
O,O-Diethyl phosphorothioate	(2465-65-8)	Not Listed
O,O-Diethyl phosphorodithioate	(298-06-6)	Not Listed
Sodium hexafluorosilicate	(16893-85-9)	Not Listed
Methylphosphonothioic dichloride	(676-98-2)	2B
Diethylamine	(109-89-7)	Not Listed
Aluminum chloride	(7446-70-0)	Not Listed
Dichloromethane	(75-09-2)	Not Listed
N,N-Dimethylaniline	(121-69-7)	Not Listed
Isopropyl bromide	(75-26-3)	Not Listed
Isopropyl ether	(108-20-3)	Not Listed
Monoisopropylamine	(75-31-0)	Not Listed
Potassium Bromide	(7758-02-3)	Not Listed
Pyridine	(110-86-1)	Not Listed
Sodium bromide	(7647-15-6)	Not Listed
Sodium metal	(7440-23-5)	Not Listed
Sulfur trioxide	(7446-11-9)	Not Listed
Tributylamine	(102-82-9)	Not Listed
Triethylamine	(121-44-8)	Not Listed
Trimethylamine	(75-50-3)	Not Listed
Hexamine	(100-97-0)	Not Listed
Chlorine	(7782-50-5)	Not Listed
White Phosphorus	(12185-10-3)	Not Listed

Technical note - Chemicals are listed by name, Chemical Abstract Service (CAS) number and CWC Schedule (where applicable). Chemicals of the same structural formula (e.g., hydrates) are controlled regardless of name or CAS number. CAS numbers are shown to assist in identifying whether a particular chemical or mixture is controlled, irrespective of nomenclature. However, CAS numbers cannot be used as unique identifiers in all situations because some forms of the listed chemical have different CAS numbers, and mixtures containing a listed chemical may also have different CAS numbers.

CONTROL LIST OF DUAL-USE CHEMICAL MANUFACTURING FACILITIES AND EQUIPMENT AND RELATED TECHNOLOGY AND SOFTWARE

I. MANUFACTURING FACILITIES AND EQUIPMENT[1]

Reaction Vessels, Reactors or Agitators

Reaction vessels or reactors, with or without agitators, with total internal (geometric) volume greater than 0.1 m^3 (100 l) and less than 20 m^3 (20000 l), where all surfaces that come in direct contact with the chemical(s) being processed or contained are made from the following materials:

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight;
c) fluoropolymers (polymeric or elastomeric materials with more than 35% fluorine by weight);
d) glass or glass-lined (including vitrified or enamelled coating);
e) tantalum or tantalum alloys;
f) titanium or titanium alloys;
g) zirconium or zirconium alloys; or
h) niobium (columbium) or niobium alloys.

Agitators designed for use in the above-mentioned reaction vessels or reactors; and impellers, blades or shafts designed for such agitators where all surfaces of the agitator that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials:

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight;
c) fluoropolymers (polymeric or elastomeric materials with more than 35% fluorine by weight);
d) glass or glass-lined (including vitrified or enamelled coating);
e) tantalum or tantalum alloys;
f) titanium or titanium alloys;
g) zirconium or zirconium alloys; or
h) niobium (columbium) or niobium alloys.

Storage Tanks, Containers or Receivers

Storage tanks, containers or receivers with a total internal (geometric) volume greater than 0.1 m^3 (100 l) where all surfaces that come in direct contact with the chemical(s) being processed or contained are made from the following materials:

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[1] Note 1. The objective of these controls should not be defeated by the transfer of any non-controlled item containing one or more controlled components where the controlled component or components are the principal element of the item and can feasibly be removed or used for other purposes.

N.B. In judging whether the controlled component or components are to be considered the principal element, governments should weigh the factors of quantity, value, and technological know-how involved and other special circumstances which might establish the controlled component or components as the principal element of the item being procured.

Note 2. The objective of these controls should not be defeated by the transfer of a whole plant, on any scale, which has been designed to produce any CW agent or controlled precursor chemical.

Note 3. The materials used for gaskets, packing, seals, screws, washers or other materials performing a sealing function do not determine the status of control of the items listed below, provided that such components are designed to be interchangeable.

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight;
c) fluoropolymers (polymeric or elastomeric materials with more than 35% fluorine by weight);
d) glass or glass-lined (including vitrified or enamelled coating);
e) tantalum or tantalum alloys;
f) titanium or titanium alloys;
g) zirconium or zirconium alloys; or
h) niobium (columbium) or niobium alloys.

Heat Exchangers or Condensers

Heat exchangers or condensers with a heat transfer surface area of greater than 0.15 m^2, and less than 20 m^2; and tubes, plates, coils or blocks (cores) designed for such heat exchangers or condensers, where all surfaces that come in direct contact with the chemical(s) being processed are made from the following materials:

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight;
c) fluoropolymers (polymeric or elastomeric materials with more than 35% fluorine by weight);
d) glass or glass-lined (including vitrified or enamelled coating);
e) graphite or carbon-graphite;
f) tantalum or tantalum alloys;
g) titanium or titanium alloys;
h) zirconium or zirconium alloys;
i) silicon carbide;
j) titanium carbide; or
k) niobium (columbium) or niobium alloys.

Technical note: carbon-graphite is a composition consisting of amorphous carbon and graphite, in which the graphite content is eight percent or more by weight.

Distillation or Absorption Columns

Distillation or absorption columns of internal diameter greater than 0.1 m; and liquid distributors, vapour distributors or liquid collectors designed for such distillation or absorption columns, where all surfaces that come in direct contact with the chemical(s) being processed are made from the following materials:

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight;
c) fluoropolymers (polymeric or elastomeric materials with more than 35% fluorine by weight);
d) glass or glass-lined (including vitrified or enamelled coating);
e) graphite or carbon-graphite;
f) tantalum or tantalum alloys;
g) titanium or titanium alloys;
h) zirconium or zirconium alloys; or
i) niobium (columbium) or niobium alloys.

Technical note: carbon-graphite is a composition consisting of amorphous carbon and graphite, in which the graphite content is eight percent or more by weight.

Filling Equipment

Remotely operated filling equipment in which all surfaces that come in direct contact with the chemical(s) being processed are made from the following materials:

a) nickel or alloys with more than 40% nickel by weight; or
b) alloys with more than 25% nickel and 20% chromium by weight.

Valves

a) Valves, having both of the following:
    i. A nominal size greater than 1.0 cm (3/8"), and
    ii. All surfaces that come in direct contact with the chemical(s) being produced, processed, or contained are made from the materials of construction in Technical Note 1 of this entry

b) Valves, not already identified in paragraph 6.a., having all of the following:
    i. A nominal size equal to or greater than 2.54 cm (1") and equal to or less than 10.16 cm (4")
    ii. Casings (valve bodies) or preformed casing liners,
    iii. A closure element designed to be interchangeable, and
    iv. All surfaces of the casing (valve body) or preformed case liner that come in direct contact with the chemical(s) being produced, processed, or contained are made from the materials of construction in Technical Note 1 of this entry

a) Components, as follows:
    i. Casings (valve bodies) designed for valves in paragraphs 6.a.or 6.b., in which all surfaces that come in direct contact with the chemical(s) being produced, processed, or contained are made from the materials of construction in Technical Note 1 of this entry;
    ii. Preformed casing liners designed for valves in paragraphs 6.a.or 6.b., in which all surfaces that come in direct contact with the chemical(s) being produced, processed, or contained are made from the materials of construction in Technical Note 1 of this entry.

Technical Note 1. Materials of construction for valves are any of the following:

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight;
c) fluoropolymers (polymeric or elastomeric materials with more than 35% fluorine by weight);
d) glass or glass-lined (including vitrified or enamelled coating);
e) tantalum or tantalum alloys;
f) titanium or titanium alloys;
g) zirconium or zirconium alloys;
h) niobium (columbium) or niobium alloys; or
i) ceramic materials as follows:

1. silicon carbide with a purity of 80% or more by weight;
2. aluminum oxide (alumina) with a purity of 99.9% or more by weight;
3. zirconium oxide (zirconia).

Technical Note 2. The 'nominal size' is defined as the smaller of the inlet and outlet port diameters.

Multi-Walled Piping

Multi-walled piping incorporating a leak detection port, in which all surfaces that come in direct contact with the chemical(s) being processed or contained are made from the following materials:

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight;
c) fluoropolymers (polymeric or elastomeric materials with more than 35% fluorine by weight);
d) glass or glass-lined (including vitrified or enamelled coating);
e) graphite or carbon-graphite;
f) tantalum or tantalum alloys;
g) titanium or titanium alloys;
h) zirconium or zirconium alloys; or
i) niobium (columbium) or niobium alloys.

Technical note: carbon-graphite is a composition consisting of amorphous carbon and graphite, in which the graphite-content is eight percent or more by weight.

Pumps

Multiple-seal and seal-less pumps with manufacturer's specified maximum flow-rate greater than 0.6 m3/h, or vacuum pumps with manufacturer's specified maximum flow-rate greater than 5 m^3/h (under standard temperature (273 K (0o C)) and pressure (101.3 kPa) conditions), and casings (pump bodies), preformed casing liners, impellers, rotors or jet pump nozzles designed for such pumps, in which all surfaces that come into direct contact with the chemical(s) being processed are made from any of the following materials:

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight;
c) fluoropolymers (polymeric or elastomeric materials with more than 35% fluorine by weight);
d) glass or glass-lined (including vitrified or enamelled coating);
e) graphite or carbon-graphite;
f) tantalum or tantalum alloys;
g) titanium or titanium alloys;
h) zirconium or zirconium alloys;
i) ceramics;
j) ferrosilicon (high silicon iron alloys); or
k) niobium (columbium) or niobium alloys.

Technical note 1: carbon-graphite is a composition consisting of amorphous carbon and graphite, in which the graphite content is eight percent or more by weight.

Technical note 2: : The seals referred to in this control come into direct contact with the chemical(s) being processed (or are designed to), and provide a sealing function where a rotary or reciprocating drive shaft passes through a pump body.

Incinerators

Incinerators designed to destroy CW agents, controlled precursors or chemical munitions, having specially designed waste supply systems, special handling facilities, and an average combustion chamber temperature greater than 1000o C, in which all surfaces in the waste supply system that come into direct contact with the waste products are made from or lined with the following materials:

a) nickel or alloys with more than 40% nickel by weight;
b) alloys with more than 25% nickel and 20% chromium by weight; or
c) ceramics.

Technical note: For the listed materials in the above entries, the term 'alloy' when not accompanied by a specific elemental concentration is understood as identifying those alloys where the identified metal is present in a higher percentage by weight than any other element.

II. TOXIC GAS MONITORING SYSTEMS AND THEIR DEDICATED DETECTING COMPONENTS

Toxic gas monitoring systems and their dedicated detecting components as follows: detectors; sensor devices; replaceable sensor cartridges; and dedicated software therefore

i. designed for continuous operation and usable for the detection of chemical warfare agents or controlled precursors at concentrations of less than 0.3 mg/m^3; or
ii. designed for the detection of cholinesterase-inhibiting activity

III. RELATED TECHNOLOGY

'Technology', including licenses, directly associated with -

- CW agents;
- controlled precursors; or
- controlled dual-use equipment items,
- to the extent permitted by national legislation.

This includes:

- transfer of 'technology' ('technical data') by any means, including electronic media, fax or telephone;
- transfer of 'technology' in the form of 'technical assistance'.
- Controls on 'technology' do not apply to information 'in the public domain' or to 'basic scientific research' or the minimum necessary information for patent application.

The approval for export of any controlled item of dual-use equipment also authorises the export to the same end-user of the minimum 'technology' required for the installation, operation, maintenance or repair of that item.

IV. SOFTWARE

Controls on 'software' transfer only apply where specifically indicated in sections I and II above, and do not apply to 'software' which is either:

a) Generally available to the public by being:
    a. Sold from stock at retail selling points without restriction, by means of:
        i. Over-the-counter transactions;
        ii. Mail order transactions;
        iii. Electronic transactions; or
        iv. Telephone call transactions; and
    b. Designed for installation by the user without further substantial support by the supplier; or
b) 'In the public domain'.

Definition of Terms

'Basic scientific research'

Experimental or theoretical work undertaken principally to acquire new knowledge of the fundamental principles of phenomena or observable facts, not primarily directed towards a specific practical aim or objective.

'Development'

'Development' is related to all phases before 'production' such as:

- design
- design research
- design analysis
- design concepts
- assembly of prototypes
- pilot production schemes
- design data
- process or transforming design data into a product
- configuration design
- integration design
- layouts

'Export'

An actual shipment or transmission of controlled items out of the country. This includes transmission of 'technology' by electronic media, fax or telephone.

'in the public domain'

'In the public domain', as it applies herein, means 'technology' or 'software' that has been made available without restrictions upon its further dissemination. (Copyright restrictions do not remove 'technology' or 'software' from being in the 'public domain').

'Microprogramme'

A sequence of elementary instructions maintained in a special storage, the execution of which is initiated by the introduction of its reference instruction register.

'Production'

'Production' means all production phases such as:

- construction
- production engineering
- manufacture
- integration
- assembly (mounting)
- inspection
- testing
- quality assurance

'Programme'

A sequence of instructions to carry out a process in, or convertible into, a form executable by an electronic computer.

'Software'

A collection of one or more 'programmes' or 'microprogrammes' fixed in any tangible medium of expression.

'Technology'

Specific information necessary for the 'development', 'production' or 'use' of a product. The information takes the form of 'technical data' or 'technical assistance'.

'Technical assistance'

May take forms, such as: instruction, skills, training, working knowledge, consulting services. 'Technical assistance' includes oral forms of assistance. 'Technical assistance' may involve transfer of 'technical data'.

'Technical data'

May take forms such as blueprints, plans, diagrams, models, formulae, tables, engineering designs and specifications, manuals and instructions written or recorded on other media or devices such as disk, tape, read-only memories.

'Use'

Operation, installation (including on-site installation), maintenance (checking), repair, overhaul or refurbishing.